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# SCIENCE

FRIDAY, MAY 19, 1916

## TEACHING AND PRACTISE<sup>1</sup>

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It would be impossible to address this congress without a word of affectionate tribute to the memory of three great men who have presided over these meetings in years that have passed, figures, alas, that we shall not see again.

Fitz, the patient, discriminating student, the wise, inspiring teacher, whose keen eye and orderly mind shed light upon obscure corners of the art of medicine; Mitchell, the poet, the brilliant physiologist, the acute and sympathetic reader of men's minds, the great practitioner; Trudeau, the optimist who, in his long journey through the "valley of the shadow of death," led so great an army of sufferers to the land of light. 'Tis a heavy loss. But what a varied and lasting inspiration the lives of these men have left for us and for the world!

In the last several years, especially through the activities of the American Medical Association, the Carnegie Institution and the General Education Board, questions relating to medical education have been discussed very actively in America, and the changes and improvements in our methods of teaching and in the character and training of those who teach have been greater probably than in any other like period in the history of American medicine.

The relations between teaching and practise in hospital and in university have of late been the subject of especially vigorous controversy in this as in other countries. To one who for five and twenty years has

<sup>1</sup> Address of the president of the Congress of American Physicians and Surgeons delivered at Washington on May 9.

MSS. intended for publication and books, etc., intended for review should be sent to Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

been engaged with more or less activity in the practise as well as in the teaching of medicine, who has been associated with two universities in which interesting experiments in medical education are now in progress, these discussions have been of absorbing interest.

With all the divergences of opinion and amid all the heat of discussion the goal aimed at is almost universally the same. It is our desire that the hospital, the school of medicine and the teaching staff shall be so organized that the ultimate service to humanity may be the largest; that we may gain greater knowledge of disease; that we may acquire more efficient means, public and private, of recognition, prevention and alleviation of the innumerable ills to which the human race and its inarticulate companions and servants are heir; that we may become more efficient in the care of our patients; that we may train better physicians. These are the main ends of the study of medicine. It has seemed to me well to devote this hour to a discussion of some of the phases of the relations between practise and teaching.

In the early days, the study of medicine in this country was begun in the office of the practising physician. By and by there developed schools of medicine in which the teachers were successful practitioners. The first of these schools were associated with hospitals, and although the body of teachers was not large, yet John Morgan in his famous address on medical schools, early pointed out the necessity that special branches of medicine should be taught by men who had given their greater attention to these branches in practise. The professors of medicine and of surgery who bore the brunt of the teaching and directed their departments were usually busy men much sought for by the public in their community; and the teaching in the old days con-

sisted largely of didactic lectures, with but limited demonstrations. Only thirty years ago, at the time when I was a student of medicine, the duties of the professor of theory and practise consisted solely in the delivery of several didactic lectures a week; those of the professor of clinical medicine consisted in the giving of two demonstrative clinics and one clinical conference. An assistant professor held one recitation a week. An occasional ward visit was given in one or another of the large hospitals, but these opportunities were improved by but a small proportion of the students. Physical diagnosis was taught during the second year to a class of about ninety by three instructors in several hourly exercises a week in sections of 20-30. This constituted the work of the department of medicine.

The direction of such a department was properly confided to a distinguished practitioner, a man of wide experience; and its management involved demands upon his time no greater than were compatible with the suitable performance of his hospital and private duties.

In such a school of medicine the clinical instruction of a single medical department or unit could be, and often was, carried out in a variety of hospitals—those hospitals with which the professors of medicine had the good fortune to be connected. The only association between the university and the hospitals was, in many instances, an amicable agreement on the part of the latter to allow instruction in the out-patient departments, through public clinics in amphitheater and operating room, and to a certain limited extent in the wards. There were no university laboratories connected with the hospital. University laboratories existed at another center which might or might not be near, or at a considerable distance from the hospital. These laboratories depended in large part upon the hospital

for their material, but did not often, excepting through the good will of the clinician and pathologist, control the supply; and, excepting to a very limited extent, the laboratories at the school rendered no especial service to the hospital.

In such a school of medicine a hospital was an accessory, a very close and valuable accessory to be sure, but yet an accessory to the department of medicine. And in discussing matters of medical education the hospital and the medical department of the university might be considered separately.

To-day the hospital must be considered not as an accessory to the department of medicine, but as its vital center. One can scarcely conceive of a school of medicine wholly independent of its hospital. The laboratories for the study of the chemical and anatomical and physiological phenomena of disease can not well exist at a center removed from the hospital, or under the control of individuals other than those directly associated with the hospital management. On the other hand, the hospital in many instances has come to depend largely on the cooperation of the university in the performing of some of its most essential functions. Professors, assistants, undergraduate students all go to form a corps of hospital servants invaluable to the institution. In a word, the relations between hospital and school of medicine are so close and intimate to-day that a discussion of the organization of a medical or surgical clinic, or of a department of pathological anatomy, presupposes the assumption that hospital and university be under one management or in such close affiliation as to form a single working body. For the ends aimed at by both hospital and school of medicine are closely related. The main, specific purpose of the hospital is the care of the sick; that of the school is the training of physicians. The care of the sick can be carried out best

through the employment of physicians of the highest order, and for these the hospital turns to the school. But to offer the student the best possible training the school must have opportunities for the study of disease and of pathological material, and for these opportunities it turns to the hospital. The delicacy and complication of modern methods of chemical and physical diagnosis demand laboratories and laboratory equipment which involve considerable and steadily increasing financial outlay; they call, moreover, for students of the best chemical and physical training to preside over these laboratories. This has brought it about that general hospitals which are not integral parts of a university must turn to universities for assistance, or spend, for the installation of independent laboratories and apparatus and for the employment of salaried heads of these departments, a sum of money which to many institutions is almost overwhelming. The university laboratories of bacteriology, serology, physiological chemistry and so forth where studies which are, in many instances, most practical, are to be made, should be in or adjoining a hospital. Thus the economy and mutual advantages of cooperation are clearly apparent. And more than this, in the true university hospital which is centrally situated, a community of interest is constantly drawing together the clinical and so-called scientific departments. This is particularly true of the departments of physiology, physiological chemistry and pharmacology—and to the great mutual advantage of hospital and of university.

To-day in the better equipped and organized institutions there is in ward and laboratory, in hospital and school a common effort to contribute to the advance of the science and art of medicine in its broadest sense. Both hospital and school are centers of original research. However cordial and

however free a cooperation there may be between the university and hospitals situated at a distance from the central plant, one must acknowledge the necessity to a modern medical school of one central hospital. And so it has come about that any discussion of the organization of a modern medical clinic presupposes that which, for purposes of illustration, may be called a "university hospital" as its center, and calls for a consideration of certain hospital arrangements as an integral part of the problem. Such a hospital should be organized upon a basis entirely different from that which used to prevail and still exists in many institutions. The medical clinic or the surgical clinic, if it is to do its full duty to the public, to the hospital and to the school should be a well-organized unit under the control of a single director and a corps of associates and assistants. And of this corps of associates and assistants, some at least, preferably a considerable number, should be salaried men, who are required to give a large part of their time to their hospital and university work. All of these men should be members of the teaching staff of the university. Only in a clinic organized on some such permanent plan can constructive research be carried out or systematic instruction given. The old-fashioned rotating service is incompatible with the ideals of a modern hospital or university.

According to the size of the institution one or more such clinics may exist, and there is no reason why in a large hospital there might not be two or more separate clinics, or why in a given university there might not be several more or less independent professorships of medicine with clinics at different hospitals, if the means were forthcoming to supply the necessary material for the full organization of such clinics.

But to return again to the organization

and constitution of a single department of medicine as compared with that of thirty years ago. The changes in the method of teaching clinical medicine have been great. Demonstrative clinical lectures remain an important element of medical teaching. But the place of the didactic lecture has largely been taken by practical instruction before small groups at the bedside. This involves a considerable increase in the teaching staff and increases greatly the amount of time which the teacher must give to his work. Thirty years ago the professor of medicine may have been expected to give two or three hours a week to his classes. To-day he could hardly be expected to devote less than six or eight hours to personal teaching. The problems of the teaching of physical diagnosis in its restricted sense are not so different from those of thirty years ago; but to-day it is generally recognized that the university should offer the student far more individual practical training than he used to receive. In the old days, three men, let us say, were entrusted with the teaching of a class of ninety; to-day the work would be distributed among six or eight at least.

Thirty years ago there was no such thing as a clinical laboratory, and clinical microscopy and chemistry were not taught in the medical department. Indeed, there were no special medical laboratories. To-day a modern medical clinic must, in the first place, control a clinical laboratory presided over by men who are called upon to give a considerable portion of their time to the training of the student in a large variety of methods of examination of secreta, excreta and body fluids; and this laboratory should also be a center for scientific research. Thirty years ago, it was easy for one man to preside over the entire department of medicine and to conduct his practise as well. It is extremely difficult, if not impossible, for

a practitioner to preside over the clinical laboratory to-day, and at the same time to do justice to his responsibilities as a physician.

Chemistry as related to the practise of medicine thirty years ago played a relatively small part in the medical curriculum. It was mainly restricted to its application to the study of urine, and those studies were for the most part of a simple character. To-day the chemical problems involved in the studies of human metabolism and used in the art of diagnosis are numerous and complicated, and are steadily increasing. No well-equipped medical clinic can exist without a department of chemistry, which should be presided over by a man of training and experience, capable of conducting and directing research and of overlooking the necessary studies of a variety of problems which arise in the wards of the hospital, for, as has been pointed out, no school of medicine can fulfil its mission to-day without intimate association with an adequate hospital. It is not easily conceivable that the director of the chemical laboratory could find time for medical activities outside the clinic.

The older methods of physical examination, so called, although mastered only by practise and experience, were yet mechanically simple. To-day, however, for the exploration of the human body and its activities, there are employed physical procedures which involve the use of instruments of great delicacy and demand a highly specialized technique. And subdepartments of radiology and electrocardiography each with its laboratory and its director, are necessary constituents of the modern department of medicine.

The medical clinic should also have a special department of bacteriology and serology, another subdepartment the direction of which demands much of the time of an

experienced student. Of these laboratories also the director should be one who is able to organize, conduct and stimulate research.

Again, there should be in association with every medical clinic a department of physical therapy for the study and application of mechanical, hydro- and electro-therapeutical methods; and especially for the teaching of massage and of general physical training. Such a department might, it is true, be under the combined control of affiliated medical and surgical clinics, but some of the responsibility for its organization and direction should lie with the chief of the medical service.

It has been said that the directors of these subdepartments could hardly be expected to give any essential part of their time to the practise of medicine. Are they therefore wholly to be removed from the care of the sick? Is the department of medicine to have under its control a number of subdepartments presided over by so-called "pure" bacteriologists, physiologists, physicists, chemists—men who are entirely removed from direct responsibility for the care of the sick? Far from it.

In the ideally arranged department of medicine, all of these men should have clinical duties and responsibilities—duties and responsibilities which, in a hospital, may be systematized. And in the properly organized department of medicine, although many of its members may in a sense be specialists, yet none will fail to acquire a wide general medical experience.

Let us now for a minute reconsider the problems which confront the director of a department of medicine to-day. The teacher of thirty years ago followed a relatively simple routine. The chief of a modern medical clinic finds himself the head of a complicated machine, involving the appointment of a large number of salaried assistants, the manipulation of a consider-

able budget, which alas! under present circumstances, rarely meets the demands of the situation, the coordination of a large staff of trained workers in clinical, chemical, physical, bacteriological, serological and physiological departments, and the organization of a system of group teaching to which he must himself devote a very considerable amount of his time. It is evident that the director of such a department should be a man who has had a rather broad training, who shall have had a basis of chemical instruction such as was impossible thirty years ago, and shall have spent a sufficient amount of time in work in each of the branches represented by the subdepartments of his clinic to enable him at least to comprehend the significance of the work which is there being done, and to carry out real supervision.

Time was when the teaching of medicine was, in great extent, a matter of authority. The student was led to accept precepts enounced *ex cathedra*. To-day the teaching of medicine is largely a matter of demonstration, of example, of practise. The student is inclined rather to distrust precept for which proof is not adduced; he is offered opportunities to study the symptoms of disease and its treatment by the bedside, and is instructed in methods by which he may control and confirm so far as may be, the assertions which he may read in the book or hear from the lips of the instructor. The method of authority has given way to the method of observation and inquiry.

Who should preside over such a clinic as this? Who is the ideal director of the modern medical department? Thirty years ago the professor of medicine was properly he who had obtained the greatest reputation as practitioner or consultant. This reputation was often not attained before the age of fifty, and was gained through the active practise of the art. Such a man, who with

years, might or might not have attained financial ease, might suitably, in these days, have been called upon, at a nominal salary, to direct a department and to give the two or three hours a week which were the sum total of the time exacted by the teaching duties of the professor.

But to-day it would be extremely difficult, nay, it would be almost impossible, for a man with a considerable consulting practise to organize and direct a medical clinic, such as that which I have outlined, and, in addition, to do the amount of personal teaching which would be necessary. The practitioner, even if he be purely a consultant, is not master of his own time. He may limit his consultations to special hours, but he can not cut off the increasing calls which appeal to his sympathy and come at any moment. And even if he see ever so few patients, he can not control the complicating side-questions to which relations with any one ill human being are too apt to give rise.

With the consultant as with the practitioner *sensu stricto* the human influence is the most important element in his work. The preliminary conferences indispensable for the establishment of the necessary relations of sympathy between physician and patient, the interminable confidences of the nervous invalid, the unravelling of the tangled mental complexes of the psychoneurotic sufferer, the heart to heart talks, the breaking of sad news, the straightening out of the many complications which so commonly arise in connection with grave illness, the letters to physician and family, the interviews with friends and relatives—these, as the consultant well knows, are the duties that consume his time; but they are necessary and essential parts of his work. It is not the actual time that the physician spends in the study of his patient—that is often the smaller part of it. It is the accessory duties that render it impossi-

ble for such a man properly to combine active consulting practise with the responsibilities of the directorship of a large modern clinic.

To accept such a position would necessitate the abandonment of a large part of that physician's practise; this would mean the loss of the main source of his income, unless he were a man of independent means. If then the professor of medicine in a modern university is to be chosen from the ranks of those men who have acquired great experience through professional success, it will be necessary either that the university shall pay a very considerable salary, or that the professor shall be a man of independent means. Such a salary, unfortunately, if men of this class are to be obtained, would have to be quite beyond anything that is at present possible in most universities. The successful consultant is usually put to considerable expense for the maintenance of the machinery necessary for his work, and in many instances comes to maintain a sort of existence which involves large financial responsibilities. However much such a man might desire to avail himself of the fascinating opportunities offered by the directorship of a large medical clinic, it is too commonly the case that, by the time he has well entered upon his fifth decade he has already assumed responsibilities toward others which make it impossible for him rightly to abandon the sources of his income. But this, it seems to me, is not the essential feature of the situation. Is the physician who through years of practise has become the successful consultant, the man who is best fitted to direct a large department of medicine or surgery? By no means always. Indeed, in the majority of instances, it is another course of life which should best fit a man for a university professorship.

There has arisen gradually in this coun-

try a new class of consulting physician, the man who has deliberately planned his career from the outset, who has sought through long years of study in hospital and in laboratory, in association with large clinics, to gain in a concentrated fashion, as it were, that experience which may make his clinical opinion, both from a diagnostic and therapeutic standpoint, most valuable. Long-continued service in institutions in which proper opportunities for study and research are offered, is giving to the public to-day a number of men who, while thoroughly trained and practised in modern methods of diagnosis and treatment, have accumulated, at a relatively early age, a store of actual clinical experience such as is acquired in independent practise only after a much greater time and, in the majority of cases, with a loss of touch with some of the more recent advances in medical science. These men, the products of intelligent methods of hospital management and organization, are as a rule soon called on by their colleagues in more active practise for advice and assistance as general consultants. Men who have pursued such a career, which has inevitably involved at the outset a considerable financial sacrifice, are usually men of scholarly tastes who keep in touch with laboratories in which they may continue research and cooperate with their colleagues in practise in the study of the nature and treatment of diseases. It is from this class of men that the professorships of medicine are more and more likely to be filled. Such a man may well enter upon a professorship by the time, or even before, he is forty years of age.

This leads us directly to one of the questions which has been most actively discussed of recent years: Is a man who has obtained his clinical experience largely or purely in hospitals properly fitted to teach students the essentials of the practise of medicine?



A distinguished student of the problems of medical education has been quoted as saying essentially: "Diseases are the same in the rich and in the poor, in human beings and in animals. To the clinician the ward is his laboratory, and the study of disease in the patient in the ward is, in all essentials, the same as the study of disease in the animal in a laboratory. The only difference between the study of disease in hospital and outside is that in the hospital the patient may better be observed. It is a mistake to say that it is necessary for a professor of medicine to have had experience in private practise when the same experience may be obtained more intelligently and in a much more concentrated form in the hospital."

This conception which has, by some, been regarded as characteristic of the point of view of those who have favored the establishment of professorships of medicine on the so-called "full time" basis, has been looked upon as fallacious and dangerous by many of the opponents of certain modern tendencies in medical education.

"No man," they say, "is fit to teach students the art of the practise of medicine who has not himself passed through the experiences of the practitioner. Practise in a hospital ward is one thing; practise in the home of the patient, another. He who has been accustomed to rely on the trained nurse and on the many appliances and instruments of precision which a well-appointed hospital affords, can have little conception of the difficulties which he will encounter in private practise. He whose only experience has been with the trusting, unresisting patient in the general wards, will find himself at sea when treating the whimsical, critical, prejudiced, opinionated invalid in private life. He who has been accustomed largely to study serious diseases in the wards of the hospital will have

small sympathy with, and little understanding of the trivial complaints of the super-sensitive and nervous members of the more well-to-do classes. The conditions that he is called upon to treat are to be remedied in great part by minor regulations of habits and manner of life, of eating and drinking and smoking and exercise. His main duties consist in ministering to the minds of his patients—in kindly counsel and encouragement—in advice tending toward the alleviation of a thousand petty ills which he who knows that they will pass with time, does not even consider in himself—which the less sensitive patient in the ward barely notices. How can one who has never had this experience teach students the art of practise? Is it not folly to take away the teaching of medicine from the experienced practitioner and to give it to one who has had a training which might almost be called academic? Must we not regard this idea as the dream of the layman and of the laboratory student who, with all his scientific attainments, is yet wofully ignorant of the conditions of the doctor's life and of his duties?"

There is much truth in these objections. I should have no hesitation in agreeing that the medical experience suitable to qualify a physician as a consultant or a teacher of medicine can not well be obtained wholly in the free wards of a hospital. There is a great difference between the mental workings of the patient in the free ward and those of the average individual with whom one is thrown in private practise. The stolid indifference to outside influences shown by many patients in the general wards renders the study of disease in hospital not so very different, it is true, from the study of disease in the laboratory, but so soon as one becomes associated with patients of a higher mental order, problems in diagnosis and in treatment arise which are

much more difficult and complicated. It is, it seems to me, not easily possible for one who wishes to fit himself for practise as a consultant or for the teaching of medicine to gain that experience which he should have without a considerable association with individuals of more complicated mental constitution. Moreover, there are certain diseases which, strangely enough, are rarely seen in the free wards, yet are common in outside practise, diseases the recognition and management of which are of the utmost importance. I need refer only to angina pectoris. A man who is not familiar with the mental attitude of the people among whom he or his students are going to be thrown, who has not learned by experience successfully to navigate his bark through the mist of accessory problems which befog the antichambers of the sick room, is unable to give to the student much that will be of real value in the practise of medicine. But fortunately in many hospitals to-day, the great development of private wards offers abundant opportunity for the acquisition of just this experience. The man who desires to fit himself for a position as teacher of medicine or consultant should spend a considerable period of time in practise among the class of patients which is to be found in the large private departments of many of our hospitals. Such an experience gained in the hospital will afford him in concentrated manner just what he might obtain otherwise through a much longer period of time in private practise.

This is the general course of training which the aspirant to the professorship of medicine is likely in the future to follow. His elevation to the directorship of a large department of medicine or surgery may be directly from the clinic in which he has occupied a salaried position and to which he has given his entire energies, or it may come after some years of consulting prac-

tise during which he has preserved close relations with an active clinical department.

Recognizing the magnitude of the problems associated with the organization of a large medical clinic, it has been felt that such a department could best be presided over by men who were able to give their whole energies to the university in organization, in teaching, in the conduct and direction of research. And, notably at that institution with which I have been connected for more than twenty-five years, several of the clinical departments have been reorganized upon a university plan. Through the generosity of the General Education Board, the institution has been enabled to establish a staff of university professors and salaried assistants who take charge of these clinics for hospital and university. These men, freed from the calls of outside practise, are able to give their entire time to the service of the department in the care of patients, the promotion and conduct of research and in the teaching of medicine. And as is well known, the members of this staff have agreed to abstain from the practise of their profession for their own emolument.

The discussion associated with this experiment has been very active, centering largely upon the last mentioned circumstance—the withdrawal or abstention of the university professors and their assistants from private practise. Those who have objected to this procedure have regarded the plan as unwise and even unfair to the physician himself, to the hospital, to the students and to the public.

In the first place, with regard to the professor himself, it has been pointed out, and with justice, that there can be little relation between the salary which the university could or should pay to the professor of surgery or medicine and the gross income of the successful surgeon or consultant in

a large city. It has been asserted that the opportunities brought by a considerable income for wide association with the world at large are broadening to the character of the man and are indirectly of value to the institution with which he is connected; that furthermore it must be a very serious question to the physician himself whether he is justified in planning deliberately a manner of life which can never lead to wealth or real financial freedom, when there might be open to him an opportunity to give to his family and those dependent on him the advantages which come with a large income. Is he not, it is asked, giving up the "larger life" for the smaller, and will not the university in the end suffer by the loss of the wide domestic and international relations so often established by the professor who has the material resources to visit his distant colleagues in their clinics and to entertain them at his home? Will not the hospital, more directly, lose in the absence of those cordial relations which arise to-day from the association, as a consultant, between the chief of the medical clinic and the practising physician?

Will not the students suffer, it is asked, through their association only with men who have had a more or less academic training in a hospital, who are out of touch with the exigencies of actual medical practise? Will not practitioner and consultant suffer seriously in losing their control of the hospital material which is now to pass wholly into the hands of salaried men? And will not the public suffer? May it not indeed be regarded as an injustice to the public and to the practitioner that they should be denied the services of these men especially eminent in medicine or surgery, whose opinions presumably are of special value—these men who have been chosen to direct large clinics?

It can not be denied that these objections have a certain force.

The physician who, starting from modest beginnings, has acquired, by hard work, a large income can not underestimate the blessings and the opportunities that such a revenue brings to him and to those who depend upon him. But such incomes are rarely honestly gained without very hard, very confining work, and without real intellectual hardship to the practitioner if he be a man of scientific tastes or aspirations. To one who has the temperament and ideals of the student, the advantages of a university professorship can not fail to appeal very strongly. No man who covets a fortune should select a career of a university professor. He who enters upon such a life knows from the outset what his income is to be, and what the outlook for his family. He can not expect to be a rich man, and he must plan his life accordingly. But the compensations are great to one of scholarly tastes. The opportunities for study and research offered by the university clinics and laboratories, limited though they may be at certain times by the demands of teaching, the freedom from the uncertainties, the complications, the endless activities of the life of a busy practitioner or consultant, the hours for reflection, for rest, for recreation offered by the stated vacations—these, wholly apart from the privileges and responsibilities of the organization of a large department, are advantages so great that they will always attract men of the highest order.

"And the larger life?" Who can say what "the larger life" is in itself? The "larger life," alas, does not always go with wealth and that which surrounds it; and who shall say that the opportunities which come to the university professor of distinction and to those about him are more restricted than those which are open to the

practitioner and consultant? Certain of the luxuries of life the professor may be obliged to eschew, but there are other privileges which will be his that no money can buy.

It is true that the salary of the university professor has not, in general, advanced with the incomes of those about him, or with the general scale of living; and it is, I believe, folly to attempt to put the directorship of clinical departments on a university basis at salaries such as have been in the past offered to the professors in the strictly scientific departments. Nevertheless, no one can expect such salaries to be large as compared with the income of successful men in private practise. It should, moreover, be remembered that with the successful consultant, for instance, nearly one half of his gross income is often absorbed by the legitimate expenses of his practise. The burden of these expenses is lifted from the shoulders of the university professor whose fixed income represents a revenue of nearly twice that size with the consultant.

But the salaries of university professors, whether in clinical or scientific branches, should be materially—very materially—larger than they have been in the past, if these men are not expected by outside activities to add to their incomes. I can, however, see no reason why the salary of a professor of medicine or surgery should be larger than that of a professor in a so-called scientific branch. In business circles it is true that the salary depends purely upon the immediate market value, so to speak, of the individual; that he who can in the world of affairs earn but a modest sum is able to demand a far smaller salary than a man with larger practical earning capacity. The physiologist who devotes himself single-heartedly to his teaching and his researches might, if thrown on the world to gain his living, have but a relatively small earning

capacity; the clinician, if he have attained a popular reputation, may, on the other hand, be in a position to make a considerable revenue.

Universities often obtain the undivided services, let us say of the professor of physiology, for an amount which was once but is not to-day a proper living salary for a man whose abilities and contributions to science entitle him to a comfortable and prominent position in the community; that position which it is to the advantage of the university that he should occupy. And such professors in many institutions sacrifice much to the cause of science.

This seems to me fundamentally wrong. These distinctions must eventually be removed, unless our universities are to remain as short-sighted as our national government and bring it about that our professorships, like our diplomatic posts, shall come to be situations which only men of independent means can fill.

But to return to the question of the professorships in the clinical branches. If the salary be adequate, there should always be efficient men whose ambition will be to occupy chairs of medicine and surgery even though they realize fully that the chances of the acquisition of a large income are small.

The objection that is so commonly raised as to the injustice and unwisdom of any understanding or agreement by which the directors of the departments of medicine and surgery should abstain from private consulting practise is one which, as a teacher and practitioner, has interested me greatly. As has been indicated before, it is not easy to see how the director of a modern university clinic, or the chief of a service in a large hospital organized on a similar basis, can give any essential part of his time to outside consultations. According to the tastes and character of the man, he will

probably give more or less of his time to private consultations at his clinic. To the consultant the puzzling and interesting pathological problems brought for his consideration by patients sent to his consulting room by colleagues at home and abroad, form the most valuable part of his experience. Such patients the professor of medicine and his associates will doubtless continue to see. They should form a great addition to the hospital clinic. Some of these patients they will desire to admit to the hospital for study. But these consultations the director of a large clinic could hold only at stated periods, and to this work he could give only a limited amount of time. It is difficult to see how it would be possible for the director of such a clinic to give the proper service to his department, and yet conduct anything like an active consulting practise outside the institution. Under exceptional circumstances, however, the professor will probably accept calls to outside consultations, but only under exceptional circumstances. The director of a large medical department must control his own time and his engagements. He who is openly occupied in general or in consulting practise can never truly be master of his time.

A curiously active discussion has risen upon a rather small point in connection with the practise of the salaried director of a medical clinic. In some clinics, as has been said, the understanding exists that the professor shall contribute whatever fees he may collect from private patients to the departmental funds. This procedure has excited vigorous criticism and opposition; it has, indeed, been considered fundamentally improper, subversive of the higher interests and principles of the medical profession.

This is a problem on which I have meditated seriously, and, look at it as I may, I

can not but regard it as a rather small and relatively unimportant detail of a larger general question. The professor should naturally demand suitable compensation for his services to private patients. But whether such compensation should go directly to him, or should be turned over by him to the budget of his department, seems to me a matter of detail to be settled between him and university or hospital. I am at a loss to understand the attitude of those who see in this a question of principle.

Some time before the first experiment of a university medical clinic was put into practise, a distinguished clinician whose services were sought by a well-known institution, offered independently, for the organization of his department a plan, which is very similar to that which now exists at the Johns Hopkins University. This offer outlined the establishment of his professorship upon a purely university basis, with the explicit understanding that the income from any private consultations into which he might see fit to enter, should be added to the budget of his department. Such an arrangement might be regarded as a distinct protection to the professor. For the financial questions which relate to practise are to some annoying and disturbing. And if the salary paid to the university professor be in any way sufficient, I can easily fancy that the professor might prefer to have it understood that the income from any practise which he might care to undertake should go into the budget of his department. I can also fancy that others might feel differently; that they might prefer a complete independence, expressed or implied, in this respect. I can further fancy that the university or hospital might fear that if the professor once began to accept fees from private patients, he would be in danger of being drawn into practise to such an extent that it would interfere with his

university or hospital work. But, as I have said, the question of what becomes of the professor's fees seems to me of limited importance—a detail in connection with the larger problem. I can not see in it a great question of principle.

So far as the student goes, the danger that under the direction of a salaried professor, he may be given a training more purely academic and insufficiently practical seems to me small. In the first place, it has already been pointed out that the professor of medicine will doubtless be a man who has had a considerable clinical experience with patients in all classes of life, whose training has been by no means purely academic, and although some of his associates will perhaps be men who have not yet acquired the ripened experience which should be that of the head of the department, yet no one for a moment fancies that *all* the instruction in medicine and surgery will be given by the nucleus of teachers wholly dependent on their salaries. In every large clinic, and in every large hospital affiliated with a university, a considerable part of the instruction in general medicine and surgery, as well as in specialties, must be entrusted to men with or without salaries, who are more or less actively engaged in practise. The fancy that because the director of such a clinic and many of his assistants are no longer at the beck and call of the public, the student is to be regarded as deprived of the opportunities offered by association with men who have been or are engaged in active practise, is a misconception.

That which the reorganization of a clinic upon a university basis should do, however, is to bring it about that the practitioners who share in the work and advantages of the hospital and take part in the instruction may be rather more carefully and wisely chosen than they have been in

the past. Well-digested experience, merit and teaching ability should more clearly and surely be recognized by a director untrammelled by hospital traditions and bent solely on the improvement of his clinic.

The experienced clinician who is still engaged in private or consulting practise, if he be a man of high order, is not likely to lose his touch with the hospital or with the clinic so long as he is able and desirous of giving it his services. Indeed, it is probable that in the future, institutions will retain a closer connection with some of the members of the staff who are engaged in private consulting practise by offering them the privileges of consulting rooms at the hospital. This plan, which has already been adopted in some instances, ought to be of great mutual advantage to hospital, to physician and to patient. To the hospital because it brings into close connection with the clinic those examples of rare and unusual disease which are sent to the consultant; to the physician because he is able to give much more time to his work at the hospital; to the patient because if the consulting room of the physician be at the hospital center, the many accessory examinations which so often have to be made, can be carried out much more expeditiously. But if such a physician be engaged in active consulting practise, he will no longer be the director of the clinic, and this, as has been pointed out, would seem to be desirable from every standpoint. For only under exceptional circumstances can such a man command the time necessary properly to direct a full department.

How much or how little time the head of a department of medicine or surgery may give to consulting practise is, however, a question which in the end must depend entirely on the character of the man. He may give very little of his time; he may give a good deal. But if he be a man

whose living interest is in his clinic, it matters little. For in either instance, through the character of the men that he associates with him, he will see that his department does its best work.

The objection so often raised that there is danger that a professor of medicine or surgery who abstains from outside consulting practise may be removed from touch with the profession, is comprehensible but not, I think, serious. If the director of the department be one who does a considerable amount of clinical work, he will still keep in active touch with the medical profession even though his consultations be held only at the hospital. In any event, the work of the department itself, set forth by him and by his associates and assistants in public clinics, in medical societies, and in journals, should keep him well before the eyes of the medical world.

The tendencies of the hour would seem to indicate that a very large nucleus of the staff of the medical or surgical clinic will in the future consist of salaried men who are giving the greater part of their time to the activities of the department; and it is very interesting that not only in hospitals affiliated with university schools of medicine, but in other independent institutions, this idea has already taken root. The experiment of a generously salaried staff of physicians and surgeons who are expected to give the greater part of their time, if not their entire time to the institution, is already being made in various hospitals.

One of the most important functions of a modern medical or surgical clinic is that it should afford opportunities for the ambitious student with scientific aspirations to pursue that course of study and acquire that experience which will fit him for a university career. Every year there graduate from our schools of medicine men with the ideals, aspirations and abilities of the true student, who, because of financial

disability, are obliged to enter directly into active practise. A certain number of these men preserve their enthusiasm, make the most of their opportunities, and return later to the pursuit of those studies which have always been the object of their ambitions. Some find unexpected intellectual satisfaction in the varied opportunities offered by the life of a practitioner. Others, dazzled by the financial rewards of success, lose their early ideals. Many, however, are obliged to sacrifice their ambitions. With the organization of the modern medical clinic, there should be a considerable number of assistantships commanding salaries which should make it possible for many of the really good men to pursue their chosen career. And it is highly desirable that such salaries should be sufficient and so graded that these men may continue their work through long years should they prove themselves of suitable character and ability.

But—and this is a question very often raised—what about the opportunities for the development of practitioners or consultants if every medical or surgical clinic become a training school for professors of medicine? The answer is simple. The training which best fits a man for a professorship differs in no way from that which best qualifies him for the career of a practitioner or consultant. Some of the men who start upon their career in a modern department of medicine will remain connected with the service in one capacity or another for ten or fifteen years or even more, until the offer of a position as assistant or professor or director in another large clinic comes to them. Many, after eight or ten years' experience, will find themselves well fitted to enter into the practise of medicine or surgery as consultants. Others after spending a shorter period of time will doubtless take up general or special practise. That to which we

may look forward with reasonable certainty, however, is that the reorganization of hospital and university clinics according to this general plan, the essential feature of which is the establishment of a large nucleus of salaried men who give the greater part of their time to the activities of their service, will provide for university, hospital and public a body of men better trained, and with richer experience than has been offered in times past.

There is one point in connection with the reorganization of the clinic upon what I have called a university basis which seems to me of real importance. This has been touched upon especially by Dr. Meltzer.<sup>2</sup> I refer to the desirability of ample provision for voluntary assistantships. This is a matter which touches especially hospital organization. The work of a modern hospital clinic has changed greatly. A well-organized medical or surgical clinic is as truly a scientific department as are the university departments of anatomy, physiology and chemistry, and in every hospital there is a constant demand for more and more students to assist in the researches which are being conducted by the various subdepartments, and incidentally in the care of the patients. The great advantage to a hospital of the presence of students in its wards has often been pointed out. Such students form a corps of extra assistants who enable us to study and care for our patients much more intelligently.

But where can one find the director of a medical clinic who is not longing for the services of more young men, recent graduates with scientific aspirations, to assist him in the study of a variety of different problems? As it is to-day, only those men who can obtain salaried positions upon the staff or are of independent means can afford to give the time required for such studies. But many a student, upon his

graduation, and during the several years that follow, would be more than willing to accept a position as voluntary assistant if he might be given a room and his lodging in the hospital. Every modern medical or surgical clinic should have a number of these positions open to such men as the professor may see fit to select. There could be no better investment for the hospital. Research assistants should be considered as essential to the welfare of the hospital as are the regular internes.

These are the considerations that I have wished to bring before you to-day. They have to do with matters which are not without public significance.

The relations of the medical sciences to the commonwealth are of great intimacy and of vital importance.

Time was when the physician was called upon only to minister to his ill or wounded fellow. To-day he is something more than the healer and the binder of wounds. The advice of the medical scientist is sought in every sphere of human activity. It is he who is called upon to outline and direct those measures which protect our homes from epidemic, our cities from pestilence. It is he who has opened the wealth of the tropics to the safe exploitation of man; to him we must look for that counsel which shall preserve the efficiency of our armies in the field and of our cohorts of industry at home; which shall lessen the horrors of war and the dangers of peace.

No effort can be too great; no sacrifice too costly that may afford to the student of the medical sciences the most active stimuli, the best opportunities for training and for research. For in the training of the student of medicine is involved more closely than is generally realized, the prosperity and safety of our country.

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<sup>2</sup> SCIENCE, 1914, XL., 620-628.